

REMARKS

The application has been amended so as to place it in condition for allowance.

Claims 1-12 are pending. Claims 1, 7, and 11 are independent. Claim 12 has been amended to change the claim dependency. Claims 1, 7, and 11 have been amended to recite the micro prisms being of approximately equal height.

There are no formal matters outstanding.

No claims are indicated to be directed to allowable subject matter.

The Rejections

The Official Action rejected claim 1 under §103 as obvious over WORTMAN et al. 5,771,328.

The Official Action rejected claims 2-3 under §103 as obvious over WORTMAN et al. in view of BIEBUYCK et al. 5,855,994 in further view of KING et al. 4,963,788.

The Official Action rejected claims 4-6 under §103 as obvious over WORTMAN et al. in view of LIND et al. 5,999,153 in further view of KING et al.

The Official Action rejected claims 7-10 under §103 as obvious over KIM 6,019,654 in view of WORTMAN et al. in further view of KING et al.

The Official Action rejected claims 11-12 under §103 as obvious over LIND et al. in view of KIM in further view of WORTMAN et al.

Arguments

As to each independent claim, see the new recitation of the micro prisms being of approximately equal height. WORTMAN et al. teaches short prism zones and tall prism zones. Equal height micro prisms is inconsistent with WORTMAN et al.

Claim 1

Claim 1 is not seen as being obvious over WORTMAN et al.

Claim 1 recites an image display apparatus comprising one or more prism sheets provided between an image emitting surface and an image display surface. More particularly, claim 1 recites prism sheet divided so as to be respectively corresponded to display elements that are minimum display units forming an image.

WORTMAN et al. appears to be offered as disclosing a prism sheet divided into display elements.

However, see WORTMAN et al. Figure 7. As clearly shown, light source 116 is common to plural elements. There is no disclosure of "display elements that are minimum display units forming an image." Accordingly, it is clear that WORTMAN et al. does not meet the recitation of the prism sheet "divided so as to be respectively corresponded to display elements that are minimum

display units forming an image." Indeed, the teaching of WORTMAN et al. is that a common light source may illuminate plural prism elements.

Accordingly, WORTMAN et al. fail to teach or suggest all the claim recitations and the obviousness rejection should be withdrawn.

The claims depending from claim 1 are believed to be allowable at least for depending from an allowable claim.

Claims 2-3

Claims 2-3 stand rejected as obvious over WORTMAN et al. in view of BIEBUYCK et al. in further view of KING et al.

WORTMAN et al. is offered for disclosing the recitations of claims 2-3, except for the image display apparatus being an organic electroluminescence display with antireflection film. For these missing features, BIEBUYCK et al. (the organic electroluminescence display) and KING et al. (the antireflection film) are offered.

The obviousness rejection is based on using the light directing film of WORTMAN et al. for the organic electroluminescence display of BIEBUYCK et al., together with the polarizing and antireflection filter of KING et al.

The primary teaching of BIEBUYCK et al. is the layer of encapsulated optical elements 18. Although the Official Action has not detailed how the BIEBUYCK et al. device would be modified to incorporate the WORTMAN et al. directing film, either the

WORTMAN et al. directing film would replace encapsulated elements layer 18 or would be in addition to layer 18.

The resulting structure proposed by the Official Action is not believed to teach or suggest all the recitations of claims 2-3. In particular, claim 2 recites the prism sheet divided into contacting and non-interfering areas respectively corresponding to only single ones of the display elements.

WORTMAN et al. does not disclose a prism sheet divided into **contacting and non-interfering areas**.

The WORTMAN et al. film comprises a repeating pattern of prism zones including zones of tall prism elements separated by zones of short prism elements. As shown by Figures 3-7, there is no vertical barrier between zones and transmitted light may from one zone to another. It is the vertical stacking of plural film layers that directs light vertically in the WORTMAN et al. film structure.

The tall prism zones are not contacting with each other, as there are intermediate short prism zones.

Further the short prism zones do not create non-interfering areas of tall prism zones since the light may travel horizontally in any one film layer.

The zones of short prism elements "significantly inhibits the occurrence of undesired optical coupling." See. column 4, beginning with line 40. Thus, even though the short

prism zones reduce interference, they do not qualify as dividing the tall prism zones into non-interfering areas.

Accordingly, the recitations of claims 2-3 are believed to be non-obvious. Withdrawal of the obviousness rejection is solicited.

Claims 4-6

The Official Action rejected claims 4-6 as obvious over WORTMAN et al. in view of LIND et al. in further view of KING et al.

WORTMAN et al. is offered for disclosing the recitations of claims 2-3, except for the image display apparatus being a liquid crystal display with circular filter and antireflection film. For these missing features, LIND et al. (the liquid crystal display) and KING et al. (the circular filter and antireflection film) are offered.

This rejection is not believed to be viable for the same reasons outlined with respect to claims 2-3. Accordingly, withdrawal of this rejection is solicited.

Claims 7-10

The Official Action rejected claims 7-10 as obvious over KIM in view of WORTMAN et al. in further view of KING et al.

The above outlined shortcomings of WORTMAN et al. also apply to this rejection.

Consider claim 7's recitation of "said prism sheet is divided by separators into adjacent contacting prism areas for

each of the red, blue, and green display elements, the separators ensuring that light from one display element passes only through a corresponding prism area and does not pass into any adjacent prism areas." WORTMAN et al. does not disclose separators "ensuring that light from one display element passes only through a corresponding prism area and does not pass into any adjacent prism areas." Although the short prism zones of WORTMAN et al. may reduce contamination between adjacent tall prism areas, they do not meet the requirement of ensuring no light passes into any adjacent prism area.

Accordingly, claims 7-10 are believed to be patentable.

Claims 11-12

Claims 11-12 stand rejected as obvious over LIND et al. in view of KIM in further view of WORTMAN et al.

KIM is offered as disclosing separators. See KIM Figure 2 with partition walls 13 separating horizontally adjacent green, red, and blue color regions. However, see that LIND et al. does not disclose horizontally adjacent color regions but discloses a color filter stack 22 comprising three vertically adjacent color layers.

Accordingly, there is no motivation to modify LIND et al. to include partition walls 13.

Thus, there is no teaching of the recited color filter having separators separating each of the color filter elements

from adjacent color filter elements so that light from each display element passes only through one color filter element.

Claim 12 also recites the prism sheet being divided by separators into adjacent prism areas, the separators ensuring that light from any one element of the color filter passes only through a corresponding prism area and does not pass into any adjacent prism areas.

This recitation is not met by WORTMAN et al.

Accordingly, claims 11-12 are believed to be non-obvious.

Reconsideration and allowance of all the pending claims are therefore respectfully requested.

In view of the above, applicant believes that the present application is in condition for allowance and an early indication of the same is respectfully requested.

Attached hereto is a marked-up version showing the changes made to the claims. The attached page is captioned "PENDING CLAIMS/MARKED-UP COPY OF CLAIMS".

Respectfully submitted,

YOUNG & THOMPSON

By



Roland E. Long, Jr.
Attorney for Applicant
Registration No. 41,949
745 South 23rd Street
Arlington, VA 22202
Telephone: 703/521-2297

June 2, 2003

PENDING CLAIMS/MARKED-UP COPY OF CLAIMS

--1. (twice amended) An image display apparatus comprising:

one or more prism sheets provided between an image emitting surface of an image generating part in said image display apparatus and an image display surface of said image display apparatus,

the one or more prism sheets being divided so as to be respectively corresponded to display elements that are minimum display units forming an image, and

the one or more prism sheets provided with a prism surface, having micro prisms with approximately equal height, on an exit surface so that light rays incident on an incident surface exit in a vertical direction of said incident surface.--

--2. (amended) The image display apparatus according to Claim 1, wherein said image display apparatus is an organic electroluminescence display and comprises a metal electrode layer, an electron carrying layer formed on an upper surface of said metal electrode layer, an emitting layer formed on an upper surface of said electron carrying layer, a hole carrying layer formed on an upper surface of said emitting layer, an Indium Tin Oxide film formed on an upper surface of said hole carrying layer, a glass substrate arranged on an upper surface of said Indium Tin Oxide film and a circularly polarizing filter and an

antireflection film arranged on an upper surface of said glass substrate, and wherein said prism sheet is provided between said Indium Tin Oxide film and said antireflection film, is divided into contacting and non-interfering areas so as to be respectively corresponded to only single ones of the display elements that are minimum display units forming an image of said emitting layer and is provided with a prism surface on an exit surface so that light rays incident on an incident surface output in a vertical direction of said incident surface.--

--3. (amended) The image display apparatus according to Claim 2, wherein said prism sheet is laminated between said glass substrate and said circularly polarizing filter.--

--4. (amended) The image display apparatus according to Claim 1, wherein said image display apparatus is a liquid crystal display and comprises a lower substrate part including a first glass substrate, a first polarizing filter formed under a lower surface of said first glass substrate, and a first Indium Tin Oxide film formed on an upper surface of said glass substrate and provided with display elements that are minimum display units forming an image in a matrix, a light-introducing plate arranged under a lower surface of said lower substrate part, a light source arranged adjacently to said light-introducing plate, an upper substrate part including a second glass substrate, a color filter divided so as to be respectively corresponded to said

display elements that are said minimum display units forming said image and formed on said second glass substrate and a second Indium Tin Oxide film that is a common electrode formed under a lower side of said second glass substrate, liquid crystal elements arranged between said lower substrate part and said upper substrate part, a second polarizing filter provided on an upper surface of said upper substrate part and antireflection film provided on said second polarizing filter, and wherein said prism sheet is provided between said upper substrate part and said antireflection film, is divided into contacting and non-interfering areas so as to be respectively corresponded to said display elements that are minimum display units forming an image and is provided with a prism surface on an exit surface so that light rays incident on an incident surface exit in a vertical direction of said incident surface.--

--5. (pending) The image display apparatus according to Claim 4, wherein said prism sheet is provided between said second polarizing filter and said antireflection film.

--6. (pending) The image display apparatus according to Claim 4, wherein said prism sheet is provided between said upper substrate sheet and said second polarizing filter.

--7. (amended) An image display apparatus, comprising:
an organic electroluminescence display layer comprising

red, green, and blue display elements arranged in a matrix and for emitting red, green, and blue light rays;

a glass substrate located on said display layer;

a prism sheet for condensing the emitted light rays [102] emitted from said display elements;

a display surface layer located on said prism layer, wherein,

said prism sheet is divided by separators into adjacent contacting prism areas for each of the red, blue, and green display elements, the separators ensuring that light from one display element passes only through a corresponding prism area and does not pass into any adjacent prism areas, [and]

said prism sheet includes a planar lower surface through which planar surface the emitted light enters as scattered light rays incident on the prism sheet and optical paths are refracted by an optical refraction function of a prism surface of the prism sheet to condense the scattered light rays in a vertical upward direction of the display surface, and

said prism surface has micro prisms with approximately equal height.--

--8. (pending) The apparatus of claim 7, further comprising a transparent control electrode layer located on said display layer.

--9. (pending) The apparatus of claim 7, wherein,

said display surface layer comprises:

a circularly polarizing filter layer located on said prism sheet; and

an antireflection film laminated against said circularly polarizing filter layer.

--10. (pending) The apparatus of claim 7, comprising a plurality of said prism sheet laminated in any number of layers between said display layer and the display surface layer.

--11. (amended) A liquid crystal image display apparatus, comprising:

a first transparent electrode layer;

a liquid crystal display layer located on said first transparent electrode layer, the display layer comprising display elements of minimum display units forming an image in a matrix;

a second transparent electrode layer located on said display layer;

a color filter of red elements, green elements, and blue elements located to color light rays passing through the display layer, each of the red elements, the green elements, and the blue elements in said color filter corresponding to one display element of the display layer;

separators separating each of the color filter elements from adjacent color filter elements so that light from each display element passes through only one color filter element;

a polarizing filter located on said color filter;

a prism sheet divided to correspond to each of the red elements, the green elements, and the blue elements of said color filter; and

a display surface layer laminated on said prism sheet, wherein,

said prism sheet is divided by separators into adjacent contacting prism areas for the corresponding red, blue, and green elements, the separators ensuring that light from any one element of said color filter passes only through a corresponding prism area and does not pass into any adjacent prism areas, and

said prism sheet includes a planar lower surface through which planar surface the light enters as scattered light rays incident on the prism sheet and optical paths are refracted by an optical refraction function of a prism surface of the prism sheet to condense the scattered light rays in a vertical upward direction of the display surface, said prism surface having micro prisms with approximately equal height.--

--12. (amended) The apparatus of claim [10] 11, comprising a plurality of said prism sheet laminated between said polarizing filter and said display surface layer.--